SONY

3-759-255-25(1)

Video Camera Recorder 8

Operation Manual

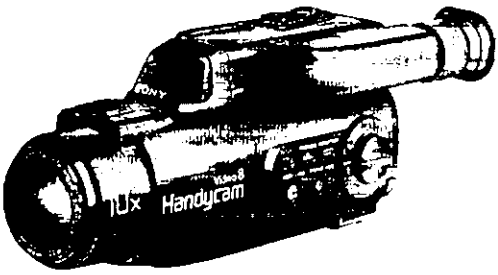


Photo: CCD-FX230

Handycam

Video 8

CCD-FX228/FX230/FX330

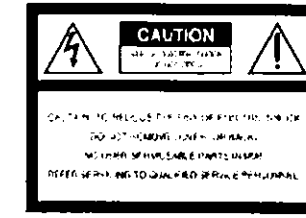
©1994 by Sony Corporation

Welcome to Video 8

Congratulations on your purchase of this Sony Handycam* camcorder. With your Handycam you can capture life's precious moments with superior picture and sound quality. Your Handycam is very easy to use. You will soon be producing home videos that you can enjoy for years to come.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-FX_____
Serial No. _____
Model No. AC-V_____
Serial No. _____

RECYCLING NICKEL-CADMIUM BATTERIES

NICKEL-CADMIUM BATTERY. MUST BE DISPOSED OF PROPERLY.

Ni-Cd

Nickel-Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest Sony Service Center or Factory Service Center for collection, recycling or proper disposal.

Note: In some areas the disposal of nickel-cadmium batteries in household or business trash may be prohibited.

For the Sony Service Center nearest you call: 1-800-222-SONY (United States only)
For the Factory Service Center nearest you call 416-499-SONY (Canada only)

Caution: Do not handle damaged or leaking nickel-cadmium batteries.

For Customers in the U.S.A.

WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

For customers in CANADA

This apparatus complies with Class B limits for radio noise emissions set out in Radio Interference Regulations.

CAUTION

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

Note on TV Color Systems

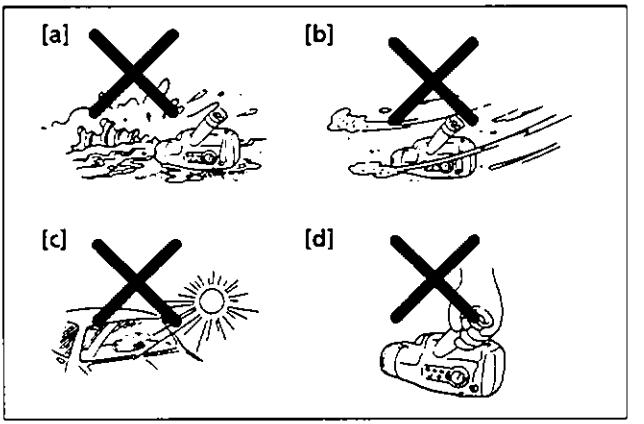
TV color systems are different depending on the countries. If you view the playback picture on a TV, you need an NTSC system based TV. When you want to use a PAL-M system based TV, you will need an NTSC / PAL-M transcoder (as this is an NTSC system based camcorder). Please check the list on page 25 to see the TV color system of your country.

Precaution on Copyright

Television programs, films, video tapes, and other materials may be copyrighted.
Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Precautions on Camcorder Care

- **Do not let the camcorder get wet. Keep the camcorder protected from rain or sea water. Otherwise, a malfunction may occur and sometimes the malfunction cannot be repaired. [a]**
- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired. [b]**
- Never leave the camcorder in temperatures above 140°F(60°C) , such as in a car parked in the sun or under direct sunlight. [c]
- Do not hold the camcorder by the viewfinder. [d]



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Checking Your Model Number

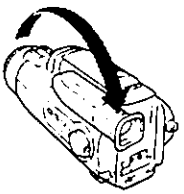
The instructions in this manual are for three models listed below. Before you start reading and operating, check your model number by looking at the bottom of your camcorder. The CCD-FX230 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "CCD-FX330 only".
As you read through this manual, buttons and settings on the camcorder are shown in capital letters.
e.g. Turn the POWER switch to CAMERA.

Types of Differences

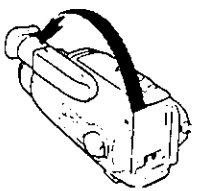
Model number	CCD-FX228	CCD-FX230	CCD-FX330
Viewfinder	monochrome	monochrome	color
Body color	gray	black	black
Wireless remote commander	×	×	○

After Taking the Camcorder out of the Box

Turn the viewfinder barrel in the direction of the arrow.

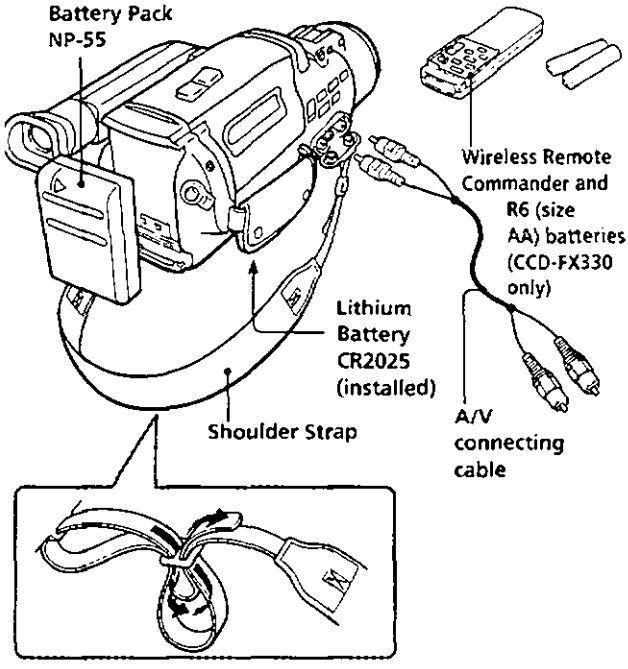


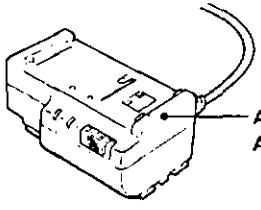
When storing your camcorder, turn the viewfinder barrel in the direction of the arrow.



Checking Supplied Accessories

Check that the following accessories are supplied with your camcorder.



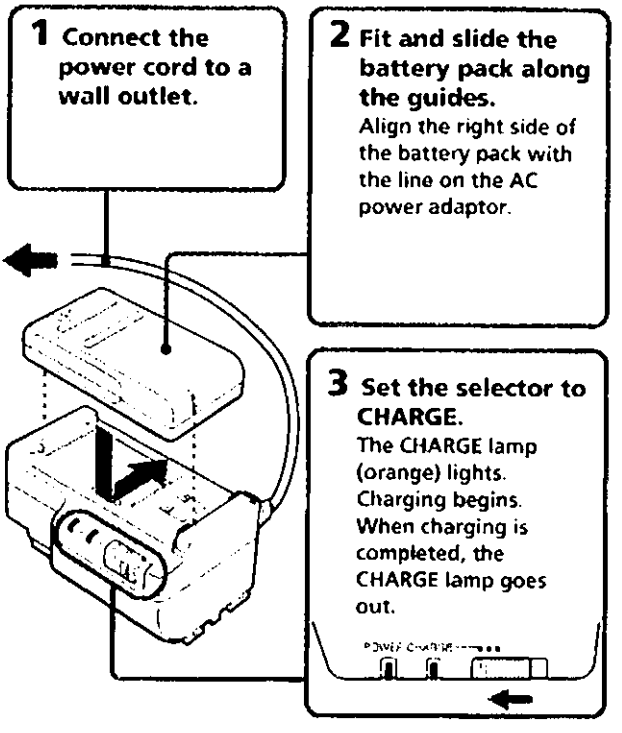


This mark indicates that this product is a genuine product related to our 8mm video equipment. When purchasing 8mm video equipment provided with this mark, we recommend that you purchase related 8mm video products provided with the same mark or products provided with our logotype mark.

1 Charging and Installing the Battery Pack

Before using your camcorder, you first need to charge the supplied battery pack. To charge the battery pack, use the supplied AC power adaptor. Charge the battery pack on a flat place without vibration.

Charging the Battery Pack


1 Connect the power cord to a wall outlet.
2 Fit and slide the battery pack along the guides.
Align the right side of the battery pack with the line on the AC power adaptor.
3 Set the selector to CHARGE.
The CHARGE lamp (orange) lights. Charging begins. When charging is completed, the CHARGE lamp goes out.

Charging Time

Battery pack (NP-XX)	-55 (supplied)	-80 -80D	-77H	-66H	-60D
Charging time*	70	190	170	125	90

* Approximate minutes to charge an empty battery pack using the AC-V25/V25A/V25B/V25C. (Lower temperature require a longer charging time.)

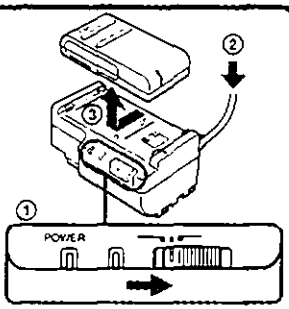
Important!

Before you recharge the battery, make sure the battery has been used up (discharged) completely (page 23).

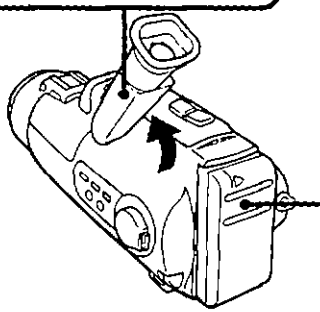
Installing the Battery Pack

1 Remove the Battery pack.

① Set the selector to the center position.
② Unplug the unit from the wall outlet.
③ Slide the battery pack in the direction of the arrow.

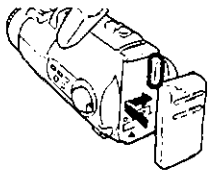


2 Lift up the viewfinder.



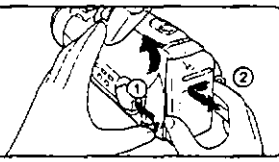
3 Fit and slide the battery pack along the guides.

Align the right side of the battery pack with



To remove the battery pack

While pressing BATT, slide the battery pack to the left.



Battery Life

CCD-FX228/FX230

Battery pack (NP-XX)	-55 (supplied)	-80 -80D	-77H	-66H	-60D
Typical*	35	95	90	65	45
Continuous**	65	170	160	120	85

CCD-FX330

Battery pack (NP-XX)	-55 (supplied)	-80 -80D	-77H	-66H	-60D
Typical*	30	85	85	60	40
Continuous**	55	150	145	105	75

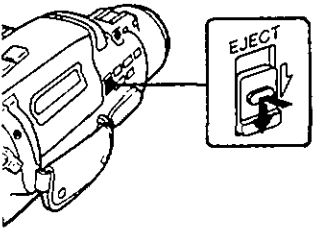
* Approximate minutes when recording while you repeat recording start/stop and turning the power on/off. The actual battery life may be shorter.

** Approximate continuous recording time indoors.

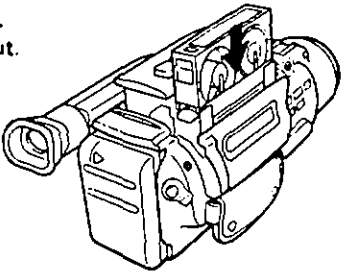
2 Inserting a Cassette

Make sure that a power source such as battery pack is installed.

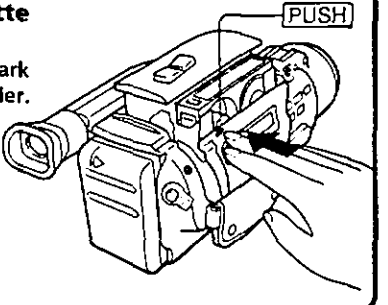
1 Open the cassette holder.
While pressing the small blue button on the EJECT knob, slide it in the direction of the arrow.
The cassette holder automatically lifts up and opens.



2 Insert a cassette.
The window faces out.



3 Close the cassette holder.
Press the "PUSH" mark on the cassette holder.



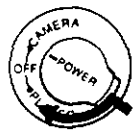
Caution
The cassette holder goes down automatically. Do not force it down by hand, as this may causes a malfunction.

To eject the cassette
While pressing the small blue button on the EJECT knob, slide it in the direction of the arrow.

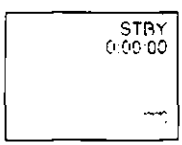
3 Adjusting the Viewfinder Lens

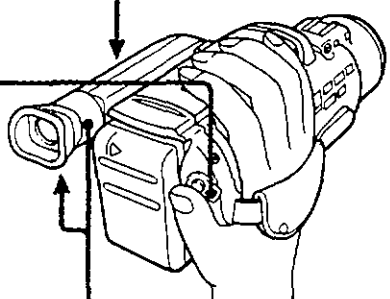
Before you use the camcorder for the first time or after someone else has used it, focus the viewfinder lens. Make sure that the power source is attached to the camcorder.

1 While pressing the green button on the POWER switch, turn it to CAMERA.



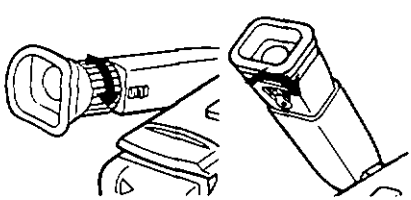
2 Turn STANDBY up.





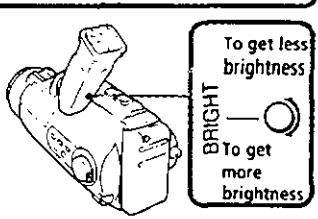
3 Turn the viewfinder lens adjustment ring/lever so that the indicator in the viewfinder come into sharp focus.

CCD-FX228/FX230 CCD-FX330



To adjust the brightness - For model with the color viewfinder (CCD-FX330 only)

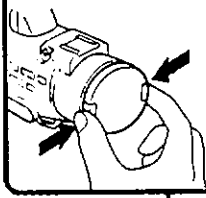
Turn the screw on the viewfinder slowly using a screwdriver (not supplied).



4 Camera Recording

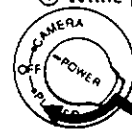
Make sure that the power source is installed and a cassette is inserted. Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working correctly.

1 Remove the lens cap, and attach it to the grip strap.

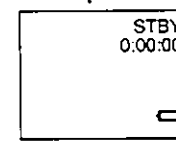


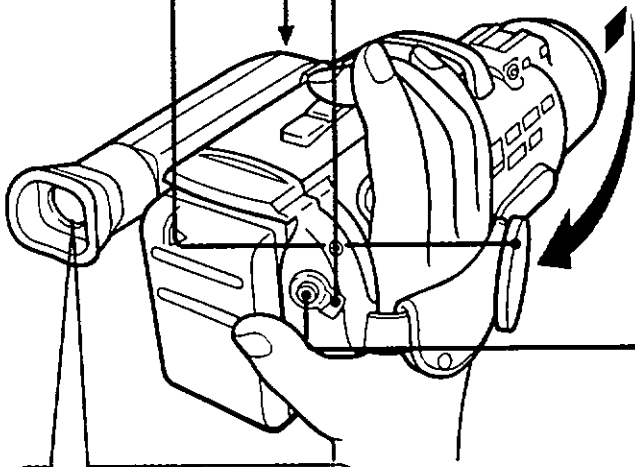
2 Turn on the power.

① While pressing the green button on the POWER switch, turn it to CAMERA.

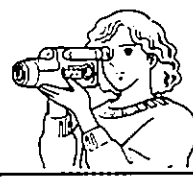


② Turn STANDBY up.

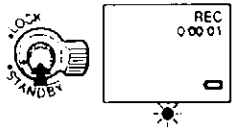




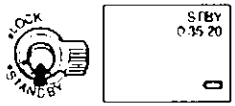
Finder
Place your eye against the finder.



3 Press START/STOP to start recording.



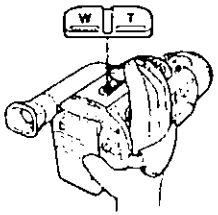
To stop recording, press START/STOP again.



To conserve battery power
Turn STANDBY down while not recording

When you finish recording
Eject the cassette, turn the POWER switch to OFF and remove the battery pack.

Using the Zoom Feature
Press the power zoom button firmly for a high-speed zoom, or press it softly for a relatively slow zoom (Dual speed zooming)
"T" side: for telephoto (subject appears closer)
"W" side: for wide-angle (subject appears farther away)



For more professional-looking recordings, use the zoom function sparingly.

Note on the tape counter
The tape counter indicates the recording or playback time. Use it as a guide. There will be a time lag of several seconds from the actual time.
To set the counter to zero, press COUNTER RESET.

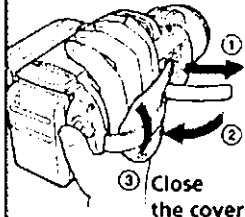
After five minutes in standby mode
If you leave the camcorder with STANDBY turn up (Standby mode) for five minutes, the camcorder goes off automatically. This prevents exhaustion of the battery and wear of the tape. To resume standby mode, slide STANDBY down once and slide it up again.

Useful Information on Recording

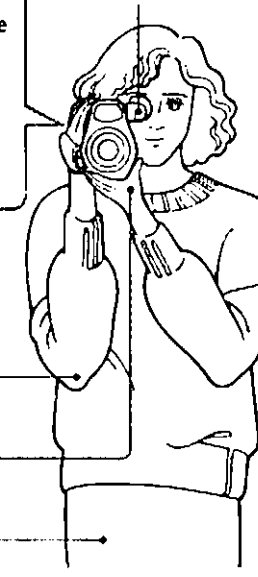
For Hand-held Shots

You'll get better results holding the camcorder by following these suggestions:

Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb.



- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frames as a guide to determine the horizontal plane.

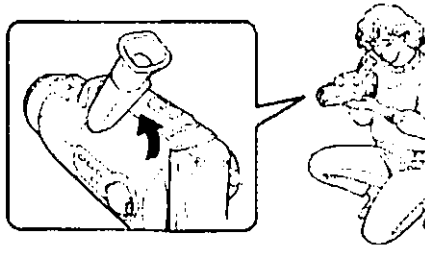


Place your right elbow against your side.

Place your left hand under the camcorder to support it.

Stand with your feet apart to keep your body steady.

You can also record in a low position to get an interesting recording angle. Lift the viewfinder up for recording from a low position. (You can turn it to 180 degrees.)



Note on the Focus Range
If you cannot get a sharp focus while in extreme telephoto zoom, press the "W" side of the power zoom button until the focus is sharp. You can shoot a subject that is at least about 3 1/4 feet (1 m) away from the lens surface in the telephoto position, or about 1/2 inches (1 cm) in the wide-angle position.

Place the Camcorder on a Flat Surface or Use a Tripod
Keep the camcorder fixed by placing it on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder. Make sure the tripod screw is shorter than 9/32 in. (6.5 mm).

To Shoot in the Dark
We recommend that you use an optional video light. To get the best color, you must maintain a sufficient light level.

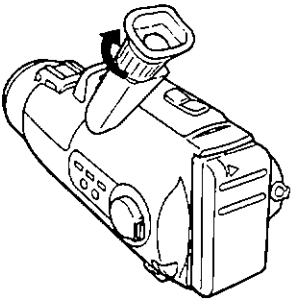
To Record from the Beginning of the Tape
Run the tape for about 15 seconds before recording. This prevents the camcorder from missing any start-up scenes when you play back the tape.

To Prevent Accidental Erasure
Slide the tab on the cassette to expose the red mark.

If you try to record with the red mark exposed, the caution lamp flashes on the viewfinder, and you cannot record.
To re-record on this tape, slide the tab back out so it covers the red mark.

For Smooth Transition
To obtain smooth transition between scenes after the battery pack is replaced, leave the tape in the camcorder.

Using the Viewfinder as a Sports Finder - For model with the monochrome viewfinder (CCD-FX228/FX230 only)
With the Sports Finder, you can monitor the picture while your eyes are at a distance from the eyecup. You can shoot scenes while moving around.
When using the viewfinder as a Sports Finder, turn the viewfinder lens adjustment ring clockwise until it stops.
CCD-FX228/FX230

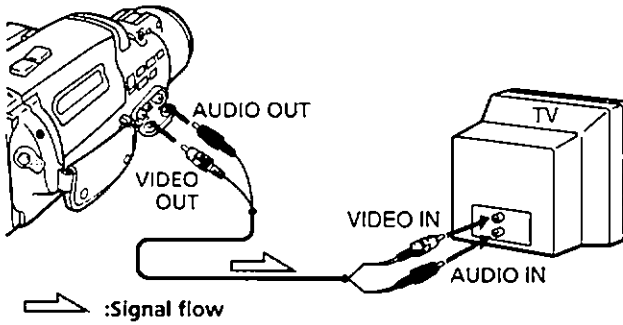


When returning to the normal viewfinder position, turn the viewfinder lens adjustment ring counterclockwise until the indicators in the viewfinder come into sharp focus.

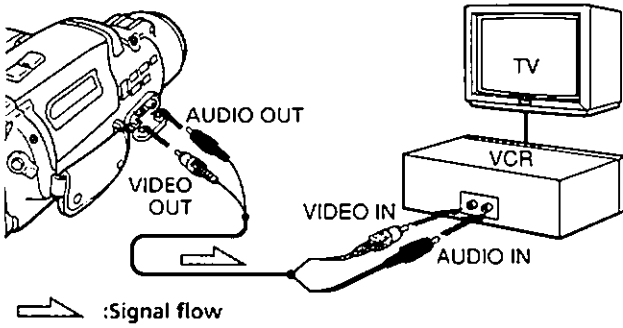
Connections for Playback

You can use this camcorder as a VCR by connecting it directly to your TV for playback.
It is recommended to use the house current as the power source (page 20).

Connect the camcorder to your TV by using the supplied A/V connecting cable. Set the TV/VCR selector on the TV to VCR.



If a VCR is connected to the TV
Connect the camcorder to LINE IN on the VCR. Set the input selector on the VCR to LINE. Set the TV/VCR selector on the TV to VCR.



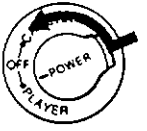
To connect a TV or a VCR without Video/Audio input jacks
Use an optional RFU adaptor.

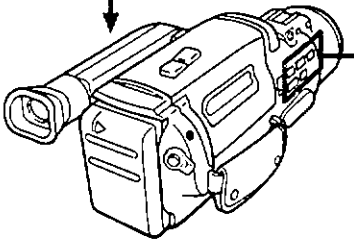
Playing Back a Tape

You can monitor the picture on a TV screen, after connecting the camcorder to a TV or VCR (page 16).You can also monitor the playback picture in the viewfinder. Make sure that a cassette is inserted.

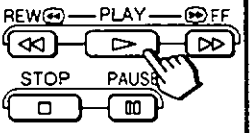
1 Turn on the power.

While pressing the green button on the POWER switch, turn it to PLAYER.





2 Press ▷.



Playback starts.

To stop playback
Press □.

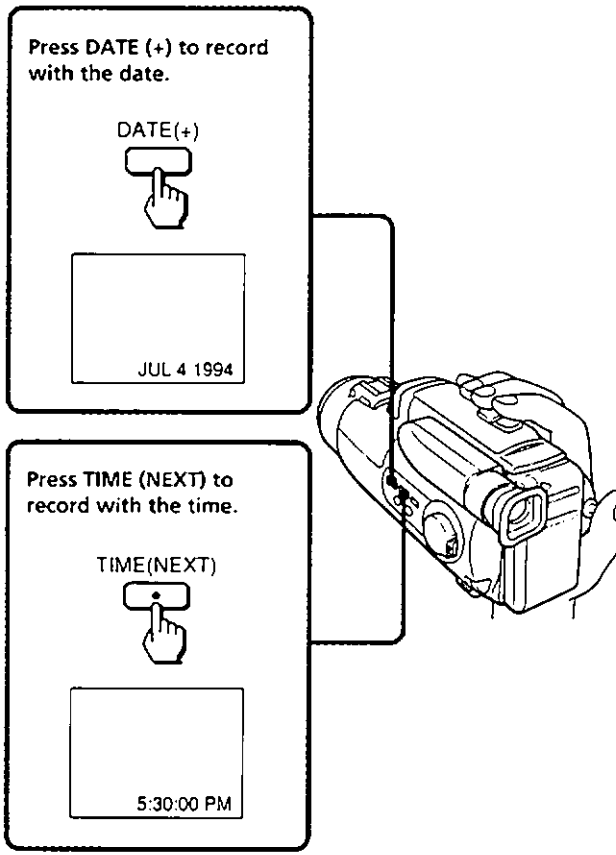
To rewind the tape
Press ◀◀.

To advance the tape rapidly
Press ▶▶.

To locate a scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback. To resume normal playback, release the button.
The sound is muted in picture search mode.

Recording with the Date or Time

You can record the date or time displayed in the viewfinder with the picture. You cannot record the date and time at the same time. Except for the date or time indicator, no indicator in the viewfinder is recorded. The clock is set to the East Coast Standard Time at the factory. You can reset the clock (page 22).

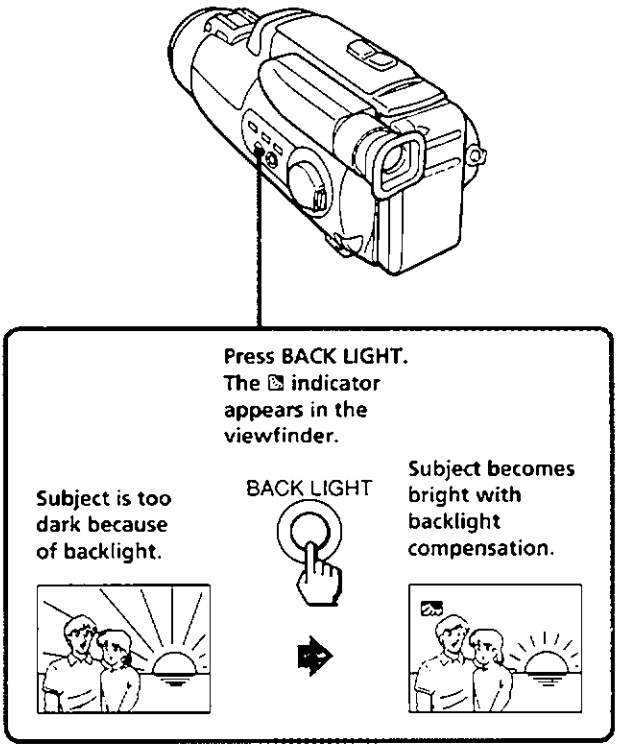


To Stop Recording with the Date or Time

Press DATE (+) or TIME (NEXT) again. The date or time indicator disappears.

Shooting with Backlighting

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT function.


Press BACK LIGHT.
The ⧉ indicator appears in the viewfinder.
Subject is too dark because of backlight.
BACK LIGHT
Subject becomes bright with backlight compensation.

After shooting

Be sure to release this adjustment condition by pressing BACK LIGHT again. The ⧉ indicator in the viewfinder disappears. Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under the following conditions:

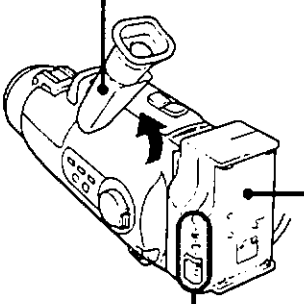
- On snow, e.g., at a ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

Using Alternative Power Source

You can choose any of the following power source for your camcorder: Battery pack (page 8), house current, and 12/24 V car battery.

Using House Current

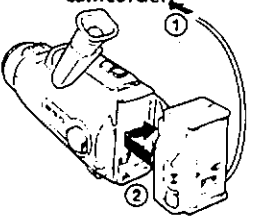
1 Lift up the viewfinder.



2 Install the AC power adaptor.

① Connect the AC power cord to a wall outlet.

② Connect the bottom of the AC power adaptor to the battery counting surface of the camcorder.



3 Set the selector of the AC power adaptor to the VTR (DC OUT) position.

To remove the adaptor

The adaptor is removed in the same way as the battery pack (page 9).

Using a Car Battery

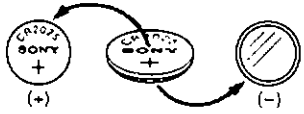
Use the DCP-77 DC pack (not supplied). Connect the cord of the DC pack to the cigarette lighter socket of the car (12 V or 24 V).

Changing the Lithium Battery

Your camcorder is supplied with a lithium battery installed. The battery for the camcorder lasts for about one year under normal operation. When the lithium battery becomes weak or dead, the ⚠ indicator flashes in the viewfinder for about five seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.**

Note on Lithium Battery

The lithium battery has a positive (+) side and a negative (-) side as illustrated. Be sure to insert the lithium battery with the positive side facing out.



WARNING

The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

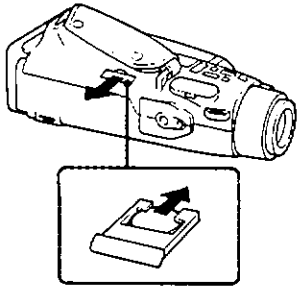
Caution

Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

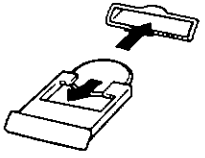
Changing the Lithium Battery

When replacing the lithium battery, keeps the battery pack or other power source attached. Otherwise, you will need to reset the date and time.

1 Remove the lithium battery holder. And pull out the lithium battery from the holder.

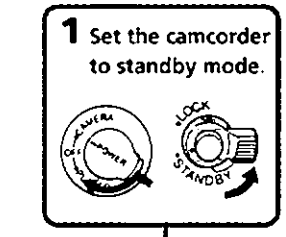


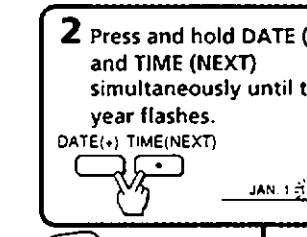
2 Install a new lithium battery with the positive (+) side facing out. And put the lithium battery holder into the camcorder.

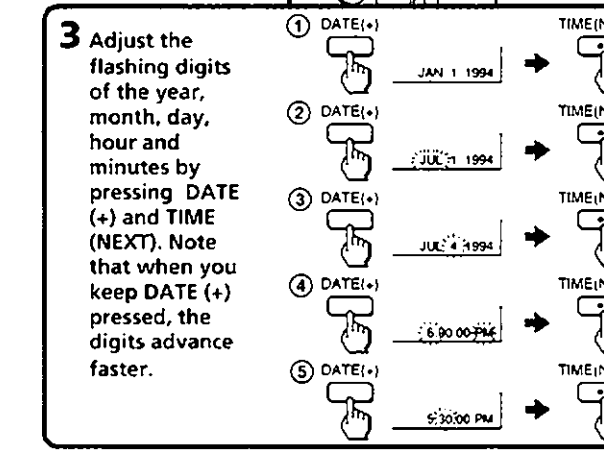


Resetting the Date or Time

You can reset the date and time.







To Correct the Date and Time Settings

Press TIME (NEXT) repeatedly until the minute digits stop flashing. Then repeat steps 2 and 3.

To Check the Preset Date and Time

Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

Note on the setting of the year

When you set the year, each time you press DATE (+) the digits changes as follows.

1994 → 1995 → - - - → 2024

Note on the time indicator

The internal clock of this camcorder operates on a 12-hour cycle.

12:00 AM stands for midnight.

12:00 PM stands for noon.

Tips for Using the Supplied Battery Pack

This section shows you how you can get the most out of your battery pack.

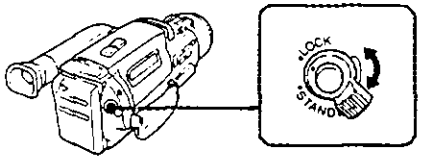
Use up Before Recharging

- Be sure to use up the battery before you recharge it. **Charging a usable battery reduces battery capacity.**
- If you finish recording before the ⌧ indicator appears in the viewfinder, turn the POWER switch to PLAYER, and leave the camcorder on until the ⌧ indicator flashes rapidly, for using up the battery.
- **Battery capacity can be recovered if you fully discharge and charge the battery again.**
- **Do not continuously recharge a charged battery pack. This will cause the battery pack efficiency to deteriorate.**

Effective Usages for Less Discharge

Conserve Battery Power

Turn off the camcorder when you're not recording. Keep in mind that when you turn STANDBY up and position the subject, select an angle, or look through the viewfinder, the battery is being used. The battery is also being used when you insert or remove a tape.



Battery Life is Shorter in Cold Environments

Battery efficiency is decreased and the battery will be used up more quickly when you record in a cold environment.

When to Replace the Battery Pack

When the ⌧ indicator in the viewfinder changes from slow flashing to rapid flashing, the battery needs to be charged.
Turn the POWER switch to OFF before replacing the battery pack for smooth transition.

Note on the remaining battery indicator

The remaining battery indicator of the camcorder may indicate a different remaining capacity from that of the battery pack with its own indicator (not supplied). The indicator on the battery pack is more accurate.

Life of the Battery Pack

If the ⌧ indicator flashes rapidly just after you turn on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new, fully charged one.

Charging Temperature

The recommended temperature range when charging is 50°F to 86°F (10°C to 30°C). Lower temperatures require a longer charging time.

After Long Storage

Recharge the battery pack after a long period of storage. If the battery pack is charged fully but not used for a long time (about one year), it becomes discharged. Charge it again, but the first few times you use it the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

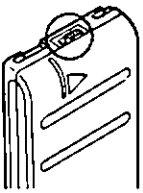
Useful Information

Always Carry Additional Batteries

Have sufficient battery pack power to do two to three times as much recording as you have planned.

How to Use the Switch on the Battery Pack

The switch is provided so that you can mark a charged battery. For example:
Set the switch to the "no mark" position when charging is completed.
Set the switch to the "red mark" position when the battery is used up.



Note on the Battery Pack

Sony batteries are recommended. Use of non-Sony batteries may damage your Handycam camcorder.

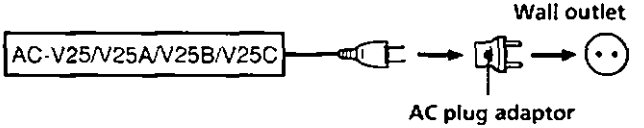
Using Your Camcorder Abroad

Each country has its own electricity and TV color systems. Before using your camcorder abroad, check the following points:

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Use a commercially available AC plug adaptor, if necessary, depending on the design of the wall outlet.



Difference in Color Systems

This camcorder is an NTSC system-based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system-based TV. When you want to use a PAL-M system based TV, you will need an NTSC/PAL-M transcoder. Check the following alphabetical list.

NTSC System Countries

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL System Countries

Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL-M System Country

Brazil

PAL-N System Countries

Argentina, Paraguay, Uruguay

SECAM System Countries

Bulgaria, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

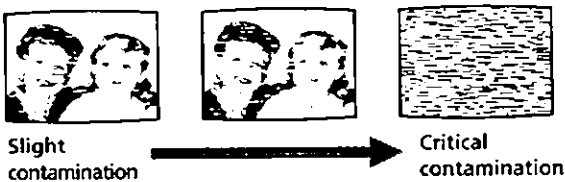
Maintenance Information

Lens and Camcorder Cleaning

- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Video Head Cleaning

Clean the video heads regularly before you start recording or playing back to ensure normal recording and clear picture. When the caution lamp in the viewfinder flashes rapidly, or when playback pictures appear as below, the video heads may be contaminated.



If this happens, clean the video heads with the optional cleaning cassette Sony V8-25CLH. After checking the picture, if it is still "noisy", repeat the cleaning. (Do not repeat cleaning more than five times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your nearest Sony dealer.

Moisture Condensation

If you bring the camcorder directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged, or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

How to Prevent Moisture Condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and leave it until it adapts to the room conditions.

(1) Be sure to tightly seal the plastic bag containing the camcorder.
(2) Remove when the air temperature inside it has reached the temperature surrounding it (in about one hour).

If Moisture Condenses Inside the Camcorder / On the Surface of the Tape

When the ⧈ or ⏏ indicator flashes in the viewfinder, this means that moisture has condensed inside the camcorder or there is moisture on the tape. If this happens, none of the functions except cassette ejection will work.

Eject the cassette, turn off the camcorder, and leave it with the cassette holder open in a dry place for at least one hour.

You can use the camcorder again if the ⧈ and ⏏ indicator does not appear again.

If Moisture Condenses On the Lens

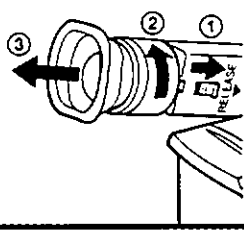
No indicator will appear, but the picture becomes dim. Turn off the power and do not use the camcorder for about one hour.

Removing Dust from Inside the Viewfinder

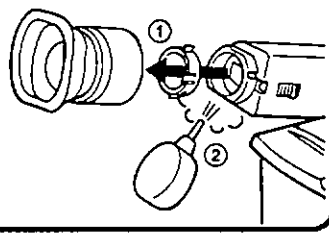
For model with the monochrome viewfinder (CCD-FX228/FX230 only)

1 While holding down the switch on the viewfinder barrel, turn the eyecup and pull it out.

CCD-FX228/FX230



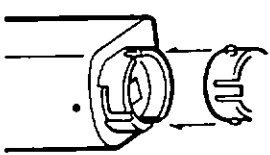
2 ① Remove the small lens from inside the viewfinder.
② Clean the surface with a commercially available blower.



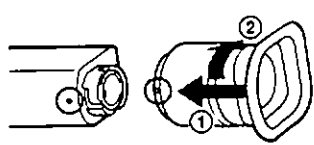
To Reattach the eyecup

1 Replace the small lens inside the viewfinder. Be sure to replace it with the correct side.

CCD-FX228/FX230



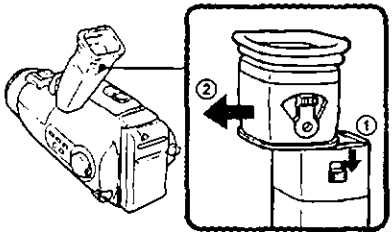
2 ① Align the groove on the eyecup with the • mark on the barrel.
② Turn the eyecup clockwise.



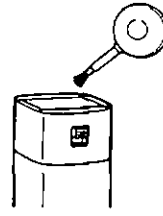
For model with the color viewfinder (CCD-FX330 only)

1 While holding down the switch, slide the eyecup in the direction of the arrow and remove it from the viewfinder.

CCD-FX330



2 Clean the surface with a commercially available blower.



To reattach the eyecup

Slide the eyecup in the opposite direction of the arrow in the above illustration.

Precautions

Camcorder

- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For AC operation, use only the accessories recommended in this manual.
- Should any solid object or liquid get inside the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Avoid rough handling, mechanical shock, or dropping the camcorder. Be particularly careful with the lens.
- Keep the POWER switch set to OFF when not using the camcorder.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **When the camcorder is not to be used for a long time, disconnect the power source and remove the tape.**
  Periodically turn on the power, operate the camera and player sections and play back a tape for about three minutes.

AC Power Adaptor

- The AC power cord should be changed only at a qualified service shop.
- The nameplate indicating operating voltage, power consumption, etc. is located on the bottom.
- The unit is not disconnected from the AC power source as long as it is connected to the wall outlet, even if the unit itself has been turned off. A negligible amount of electric current will flow into the AC power adaptor even with the selector in the center position.
- Unplug the unit from the wall outlet when it is not to be used for a long time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- Do not operate the unit if it is dropped or damaged or if its cord is damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.

- Do not place the unit in locations that are:
  - Extremely hot or cold
  - Very humid, dusty, dirty, or vibrating

If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Battery Pack

- A brand new battery pack is not charged. Before using the battery pack, charge it fully.
- **After using the camcorder, remove the battery pack from the camcorder,** and place it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even when the POWER switch is set to OFF.
- Charge the battery immediately before using the camcorder. The battery pack is always discharging even when it is not in use.
- If the battery terminals are not clean, the battery duration will be shortened. If the terminals get dirty, you can clean them by repeatedly attaching and removing the battery pack. Alternately wipe the + and - terminals with a soft cloth or paper.
- Be sure that nothing metallic comes into contact with the metal parts of the terminals. If it does, a short may occur and the battery pack may be damaged.
- Be sure to observe the following:
  - **To prevent an accident caused by a short circuit, do not allow metal objects, such as a necklace, to touch the battery terminals. Carry the battery pack attached to the terminal cover.**

  - Keep the battery pack away from fire.
  - Keep the battery pack dry.
  - Do not open or convert the battery pack.
  - Do not expose the battery pack to any mechanical shock.

Specifications

Video Camera Recorder

System

Video recording system
Two rotary heads, Helical scanning FM system

Audio recording system
Rotary head, FM system

Video signal
NTSC color, EIA standards

Usable cassette
8 mm video format cassette (standard 8 mm)

Tape speed
SP mode: Approx. 19/32 inches/s (1.43 cm/s)
LP mode: Approx. 5/16 inches/s (0.72 cm/s) (playback only)

Recording time
SP mode: 2 h (P6-120)

Playback time
SP mode: 2 h (P6-120)
LP mode: 4 h (P6-120)

Fast forward/rewind time
Approx. 6 min 30 s (P6-120)

Image device
CCD (Charge Coupled Device)

Viewfinder
Electronic viewfinder
CCD-FX228/FX230: monochrome
CCD-FX330: color

Lens
Combined 10 × power zoom lens
f= 1/4 - 2 1/2 inches (6.1 - 61 mm)
1 3/4 - 17 3/8 inches(44 - 440 mm) when converted into a 35-mm still camera
F1.6 to 2.4 with macro
Filter diameter: 37 mm (1 1/2 inches)
TTL autofocus system inner focus wide macro system

Color temperature
Auto

Minimum illumination
2 lx

Illumination range
2 lx to 100,000 lx

Recommended illumination
More than 100 lx

Aperture correction
Automatic with backlight adjustment

Output connectors

Video output
Phono jack, 1 Vp-p, 75Ω, unbalanced sync negative

Audio output
Phono jack, −7.5 dBs, (at load impedance 47 kΩ)
Impedance less than 2.2 kΩ

RFU OUT
Special mini-jack, DC 5 V

LANC control jack
Stereo mini-minijack (ø 2.5 mm)

MIC Jack
Minijack, −66dBs, low impedance with 2.5 to 3.0 V DC output, impedance 6.8 kΩ (ø 3.5 mm)

General

Power requirements
On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)

Average power consumption
When camera recording
CCD-FX228/FX230: 5.0 W
CCD-FX330: 5.5 W

Installation
Vertically, Horizontally

Operating temperature
32°F to 104°F (0°C to 40°C)

Storage temperature
−4°F to 140°F (−20°C to 60°C)

Dimensions
CCD-FX228/FX230: Approx. 4 3/4 × 4 3/8 × 10 1/2 inches (w/h/d) (118 × 106 × 265 mm)
CCD-FX330: Approx. 4 3/4 × 4 3/8 × 10 7/8 inches (w/h/d) (118 × 108 × 274 mm)
Including projecting parts and controls

Mass

CCD-FX228/FX230: Approx. 1 lb 12 oz (820g)
CCD-FX330: Approx. 1 lb 13 oz (830g)
Excluding the battery pack and cassette
CCD-FX228/FX230: Approx. 2 lb 3 oz (1020g)
CCD-FX330: Approx. 2 lb 4 oz (1030g)
Including the battery pack NP-55 and cassette

Microphone

Electronic condenser microphone, monaural type

Supplied accessories

See page 7

AC Power Adaptor

Power requirements

110-240 V AC*, 50/60 Hz

Power consumption

AC-V25: 15W
AC-V25A/V25B: 17W
AC-V25C: 18 W

Output voltage

DC OUT
AC-V25: 7.5V, 1.2A
AC-V25A/V25B: 7.5V, 1.5A
AC-V25C: 7.5V, 1.6A
In operating mode
Battery charge terminal: 10 V, 1.1 A In charge mode

Application

Sony battery packs NP-55/60D/66H/77H/80/80D

Operating temperature

32 °F to 104 °F (0 °C to 40 °C)

Storage temperature

–4 °F to 140 °F (–20 °C to 60 °C)

Dimensions

Approx. 4 1/8 × 1 15/16 × 2 1/2 inches (w/h/d) (103 × 49 × 63 mm)
including projecting parts and controls

Mass

AC-V25: Approx. 10 oz (290g)
AC-V25A: Approx. 11 oz (320g)
AC-V25B/V25C: Approx. 10 oz (300g)

Design and specifications are subject to change without notice.

* Canadian Standard Association (CSA) certifies 120 V AC only

Trouble Check

If you run into any problem using the camcorder, use the following table to identify and correct the problem.

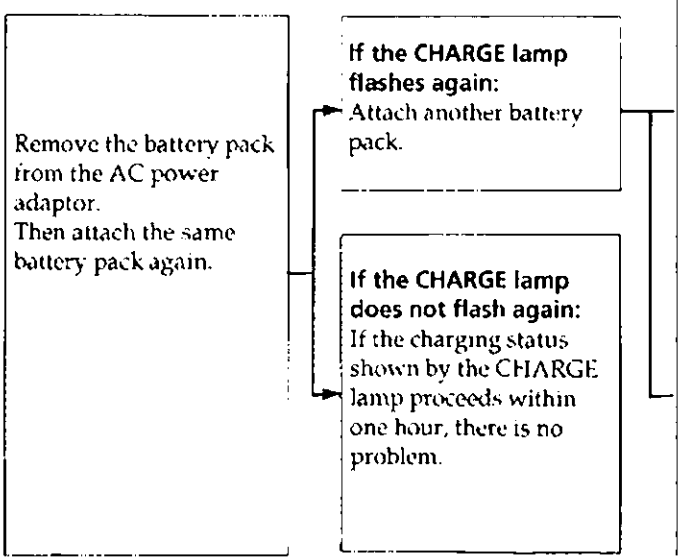
	Symptom
While recording	START/STOP button does not operate.
	The power goes off.
	The date or time indicator is flashing.
While playing back	The tape does not move when a tape transport button is pressed.
	The playback picture is not clear.
While recording / playing back	The power does not go on.
	The battery pack has quickly discharged.
	The cassette cannot be removed from the compartment.
	No buttons can be operated, while connecting the AC power adaptor.
	The image on the viewfinder screen is not clear.

Cause → Corrective Actions (page)
• The POWER switch is not set to CAMERA. → Set it to CAMERA. (12) • The tab on the cassette is out (red). →Use a new tape or slide the tab. (15) • The tape has run out. → Rewind the tape or use a new one. (17) • The tape is stuck to the drum. → Eject the cassette. (10)
The camcorder has been in Standby mode for more than five minutes. → Turn STANDBY down once and turn it up again. (13)
You pressed DATE (+) and TIME (NEXT) together for more than two seconds. → The camcorder is not malfunctioning. You may start recording. Flashing will stop soon.
•The POWER switch is not set to PLAYER. → Set it to PLAYER. (17) • The tape has run out. → Rewind the tape or use a new one. (17)
• The video heads may be dirty. → Clean the heads. (26) • The channel or input for the camcorder is not selected on the TV. →Select the correct input. (16)
• The battery is not attached. → Install the battery. (9) • The battery is dead. → Use a charged battery. (8) • The AC power adaptor is not connected to a wall outlet. → Connect the AC power adaptor to a wall outlet.
• The ambient temperature is too low. (23) • The battery pack has not been charged fully. → Charge the battery pack. (8) • The battery pack is completely dead, and cannot be recharged. (23) → Use another battery pack.
The battery is dead. → Use a charged battery or connect the AC power adaptor. (22)
The AC power adaptor is charging. You cannot operate the camcorder using AC power adaptor while charging the battery pack.
The viewfinder lens is not adjusted. → Adjust the viewfinder lens. (11)

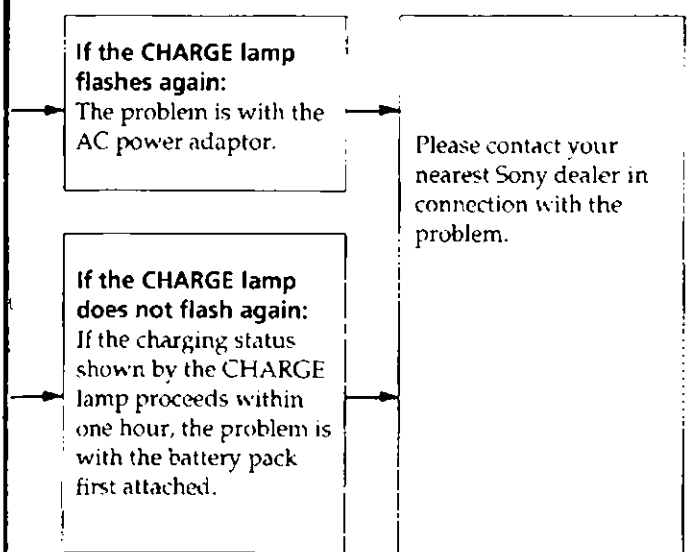
	Symptom
	There is dust in the viewfinder.
	No function except for cassette ejection works.
AC power adaptor	The POWER lamp does not light.
	The POWER lamp will remain lit for a while even if the unit is unplugged after use.
	The CHARGE lamp flashes.
	The unit becomes warm while in use.
	The battery pack gets hot during charging.

When the CHARGE Lamp on the AC Power Adaptor Flashes

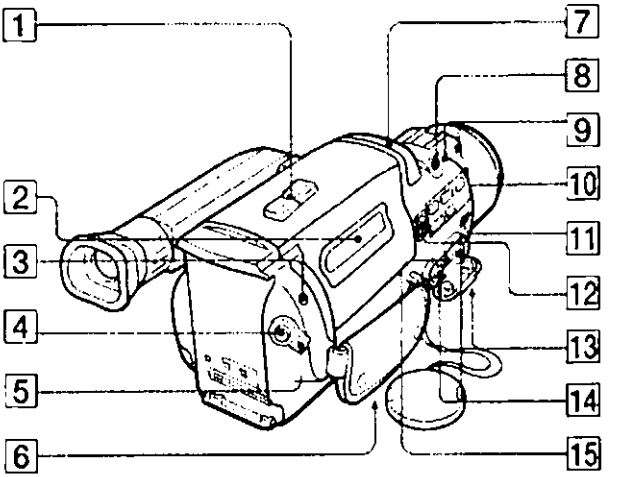
Check through the following chart.


Remove the battery pack from the AC power adaptor.
Then attach the same battery pack again.
If the CHARGE lamp flashes again:
Attach another battery pack.
If the CHARGE lamp does not flash again:
If the charging status shown by the CHARGE lamp proceeds within one hour, there is no problem.

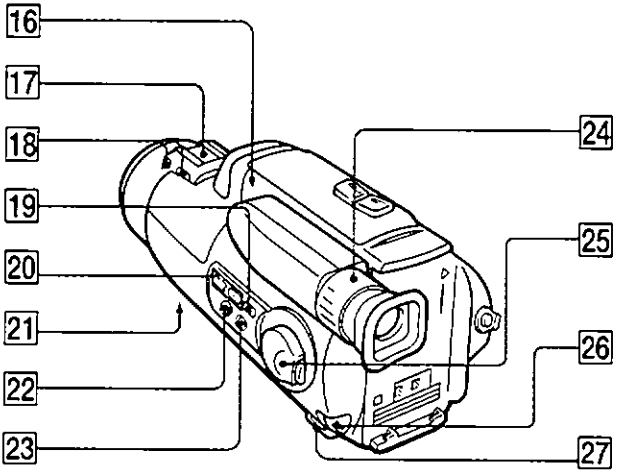
Cause → Corrective Actions (page)
→ Remove the viewfinder barrel and clean the viewfinder screen or viewfinder lens. (28)
Moisture condensation has occurred. → Remove the cassette and leave the camcorder for at least an hour. (27)
→ Set the selector to the center position and disconnect the power cord. After about one minute, reconnect the power cord and set the selector to VTR (DC OUT) again.
This is normal.
→ See the chart below.
This is normal.
This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is normal.


If the CHARGE lamp flashes again:
The problem is with the AC power adaptor.
If the CHARGE lamp does not flash again:
If the charging status shown by the CHARGE lamp proceeds within one hour, the problem is with the battery pack first attached.
Please contact your nearest Sony dealer in connection with the problem.

Identifying the Parts



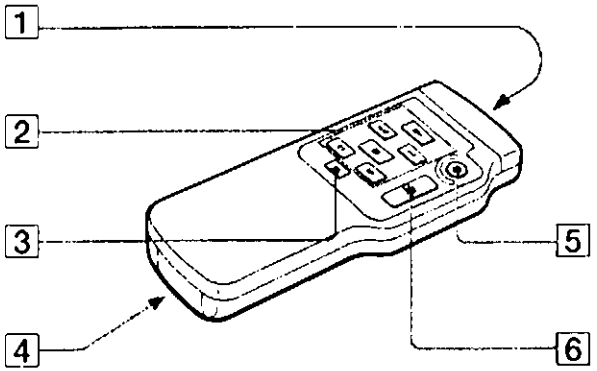
1 Power zoom button
2 Cassette compartment
3 LANC control jack
  stands for Local Application Control Bus System. The control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.
4 START/STOP button
5 STANDBY switch
6 Lithium battery holder (21)
7 Built-in microphone
8 MIC jack (PLUG IN POWER)
  Connect an optional external microphone. This jack also accepts a "plug-in-power" microphone.
9 Remote sensor
  Aim the Remote Commander here for remote control.
10 Tape transport buttons
11 Remote Commander switch
12 Eject (cassette eject) button
13 Hooks for shoulder strap
14 Audio / Video output jacks
15 RFU DC OUT (RFU adaptor DC output) jack
  To view the recorded picture on the TV that has only an antenna input, connect the RFU adaptor here.



16 Camera recording/battery lamp
17 Accessory shoe
18 Remote sensor
Aim the Remote Commander here for remote control.
19 COUNTER RESET button
20 DATE (+) and TIME (NEXT) buttons
21 Tripod receptacle (bottom) (15)
22 BACK LIGHT button
23 TAPE / BATT CHECK button
Press to display the tape remaining indicator or battery remaining indicator in the viewfinder.
24 Viewfinder lens adjustment ring
25 POWER switch
26 BATT (battery eject) knob
27 Hooks for shoulder strap

Remote Commander (CCD-FX330 only)

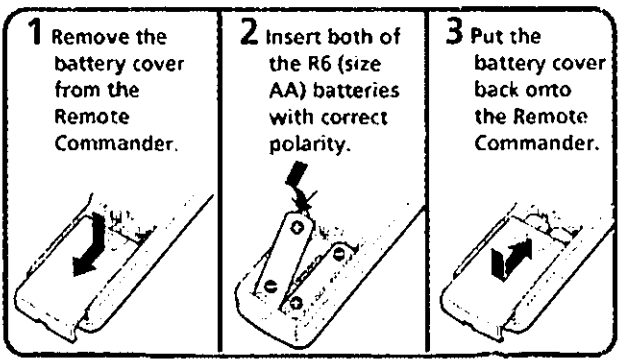
The buttons that have the same name on the Remote Commander and on the camcorder function identically.



1 Transmitter
Point toward the remote sensor to control the camcorder after turning on the POWER switch on the camcorder.
2 Tape transport buttons
3 DISPLAY button
Press to display the viewfinder screen indicators on the TV. To erase the indicators, press again.
4 R6 (size AA) battery holder
5 START/STOP button
6 Power zoom button
The zooming speed is unchangeable on the Remote Commander.

Preparing the Remote Commander

To use the Remote Commander, you must insert two R6 (size AA) batteries. Use the supplied R6 (size AA) batteries.


1 Remove the battery cover from the Remote Commander.
2 Insert both of the R6 (size AA) batteries with correct polarity.
3 Put the battery cover back onto the Remote Commander.

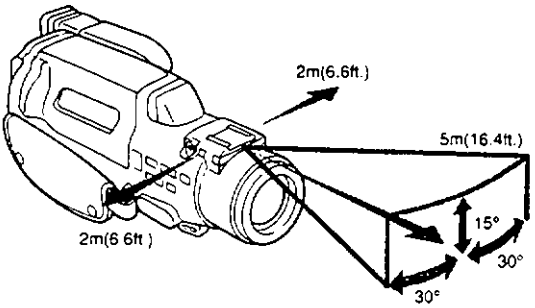
Note on battery life

The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or dead, the Remote Commander does not work.

To avoid damage from possible battery leakage

Remove the batteries when you will no use the Remote Commander for a long time.

Remote Control Direction

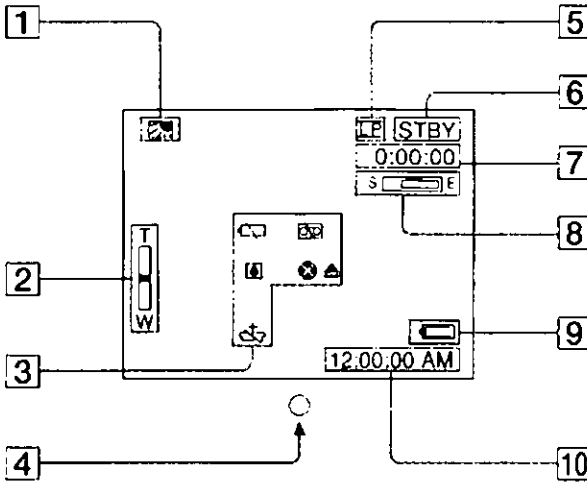


Notes on the Remote Commander

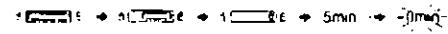
- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- This camcorder works at commander mode VTR 2. The commander modes (1,2 and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR at commander VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

Operation indicators

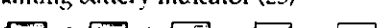
For details on each indicator, refer to pages indicated in the parentheses.



1 Back Light indicator (19)
2 Power zoom indicator
3 Warning indicators (43)
4 Recording lamp / Battery lamp
5 Light up when playing back a tape recorded in LP mode.
6 Tape transport mode
7 Tape counter
8 Remaining tape indicator



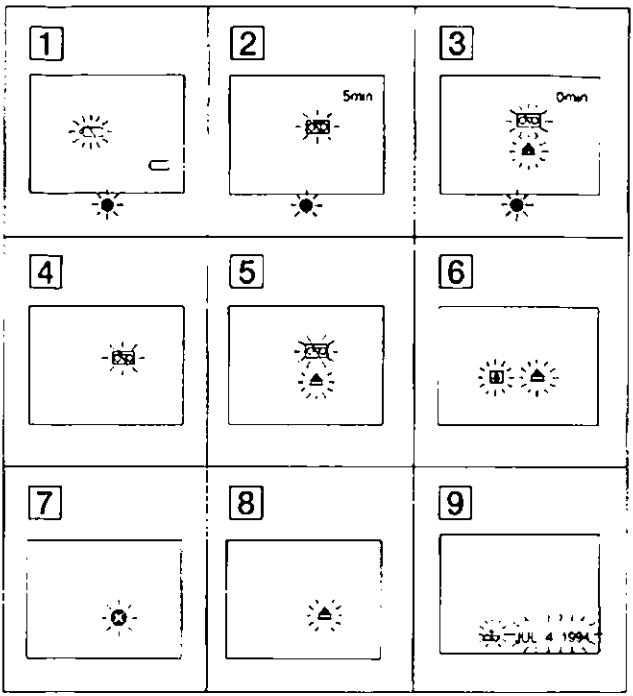
9 Remaining battery indicator (23)



10 Date or Time (22)

Warning Indicators

If indicator flash in the viewfinder or a caution on the camcorder flashes, check the following:



1 The battery is weak or dead.
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.
2 The tape is near the end.
The flashing is slow.
3 The tape has run out.
The flashing becomes rapid.
4 No tape has been inserted.
5 The tab on the tape is out (red).
6 Moisture condensation has occurred. (27)
7 The video heads may be contaminated. (26)
8 Some other trouble has occurred.
Disconnect the power source and contact your Sony dealer or local authorized facility.
9 The lithium battery is weak or is not installed. (21)

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For Product information or operation, call:
SONY CUSTOMER INFORMATION CENTER
201-368-9272

or write to:
Sony Customer Information Center
One Sony Drive Park Ridge, New Jersey
07656-8003

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